

SOIL HYDRAULIC CONDUCTIVITIES: A STEP TOWARD DETERMINING POTENTIAL AQUIFER RECHARGE ZONE

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Ground Water Recharge Zones

Some feature characteristics

- Permeable Surface Layer (based on geology or soils mapping)
- Flat or nearly flat slope aspect
- Subsurface characteristics
- Vegetation cover and land use
- Hydrology

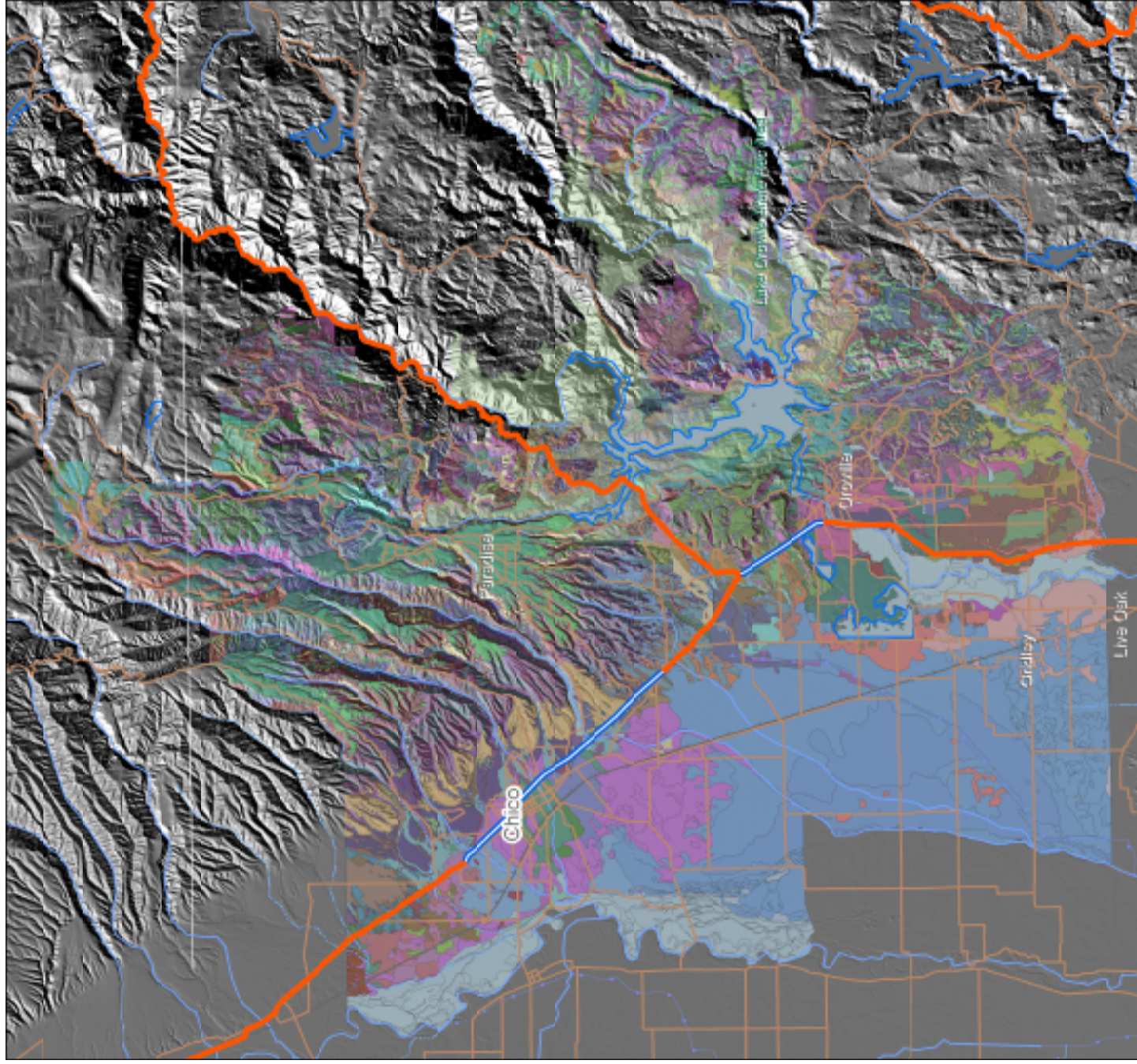
Precipitation amounts

Intensity

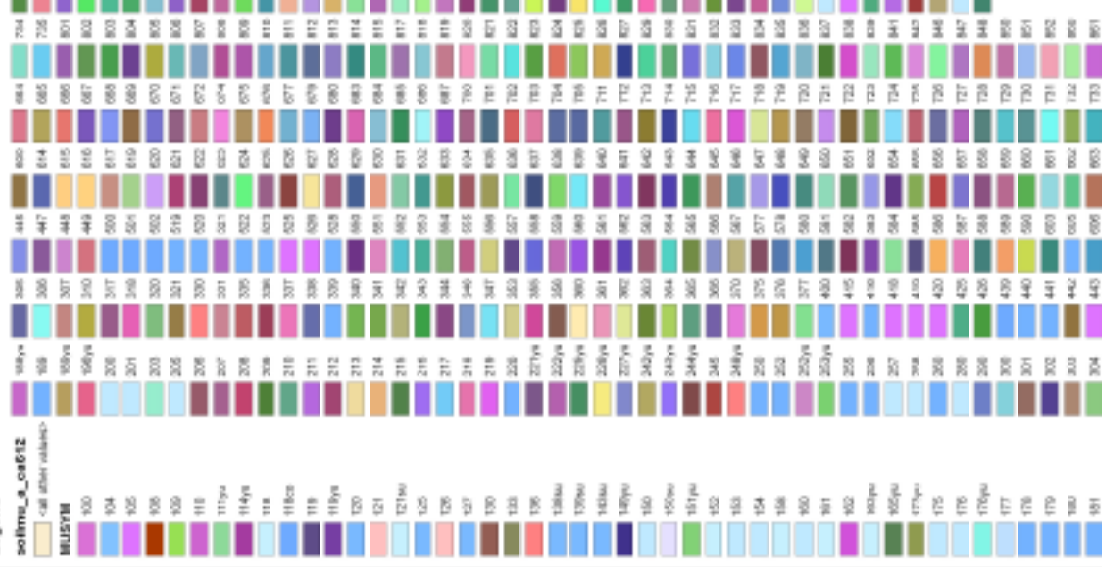
Type (Rain vs snow)



BUTTE COUNTY SOIL MAP



Legend



- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Land Management
- Recreational Development
- Sanitary Facilities
- Soil Chemical Properties
- Soil Erosion Factors
- Soil Physical Properties
 - Available Water Capacity
 - Available Water Supply, 0 to 100 cm
 - Available Water Supply, 0 to 150 cm
 - Available Water Supply, 0 to 25 cm
 - Available Water Supply, 0 to 50 cm
 - Bulk Density, 15 Bar
 - Bulk Density, One-Tenth Bar
 - Bulk Density, One-Third Bar
 - Linear Extensibility
 - Organic Matter
 - Percent Clay
 - Percent Sand
 - Percent Silt
 - Saturated Hydraulic Conductivity (Ksat)
 - Saturated Hydraulic Conductivity (Ksat), Standard Classification
 - Surface Texture
 - Water Content, 15 Bar
 - Water Content, One-Third Bar
- Soil Nutrients and Fashires

Basic Options

Result Column Name: KsatClass

Advanced Options

Aggregation Method

All Components

Dominant Condition
Dominant Component
Weighted Average
All Components

Method Description

Position is below the cutoff value will not be considered. If no
ents in the database will be considered. The data for some
y not be in the database, and therefore are not considered.

Tie-break Rule

☒ Slowest
☐ Fastest

The tie-break rule indicates which value should be selected from a
set of multiple candidate values, or which value should be selected
in the event of a percent composition tie.

Interpret Nulls as Zero

☐ Yes
☒ No

This option indicates if a null value for a component should be
converted to zero before aggregation occurs. This will be done only
if a map unit has at least one component where this value is not null.

Layer Options

☐ Surface Layer
☐ Depth Range
☒ All Layers

☐ Basic Mode☒ Advanced Mode

Aggregation Report

Map Unit Desc. Report

Saturated Hydraulic Conductivity (Ksat), Standard Classes

Layer Option: All Layers
Units of Measure: micrometers per second
Aggregation Method: All Components
Tie-break Rule: Slowest
Interpret Nulls as Zero. No

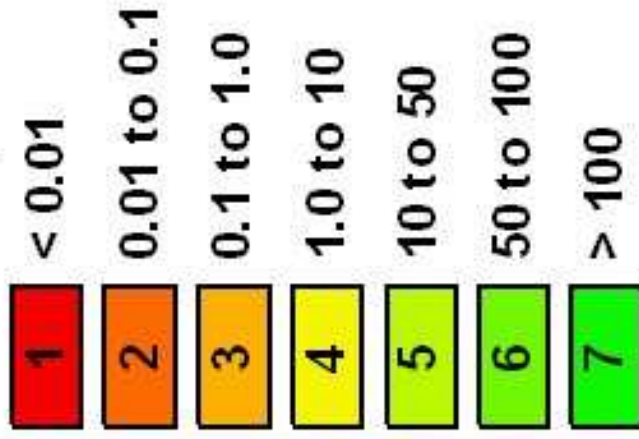
Bulle Area, California, Parts of Bulle and Plumas Counties
Survey Area Version and Date: 6 - 01/17/2007

Map symbol	Map unit name	Rating
100	ANITA-GALT COMPLEX, 0 TO 3 PERCENT SLOPES	0.5633
104	BOSQUEJO CLAY, 0 TO 1 PERCENT SLOPES	2.1740
105	BUSACCA CLAY LOAM, 0 TO 1 PERCENT SLOPES	2.5497
108	TUSCAN-IGO-ANITA COMPLEX, 0 TO 3 PERCENT SLOPES	0.5633
109	BOSQUEJO CLAY LOAM, 0 TO 1 PERCENT SLOPES	2.6039
110	BOSQUEJO SILT LOAM, 0 TO 1 PERCENT SLOPES, OVERWASH, OCCASIONALLY FLOODED	2.3371
111yu	AUBURN-SOBRANTE COMPLEX, 8 TO 15 PERCENT SLOPES	6.2909
114yu	AUBURN-SOBRANTE COMPLEX, GRAVELLY 8 TO 15 PERCENT SLOPES	7.8606
118	XERORTHENTS, TAILINGS, 0 TO 50 PERCENT SLOPES	57.3884
11800	CLEAR LAKE CLAY, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED	0.0100
119	XERORTHENTS, TAILINGS-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES	57.3884
119yu	AUBURN-SOBRANTE-ROCK OUTCROP COMPLEX, 30 TO 50 PERCENT SLOPES	9.0000
120	GRIDLEY TAXADJUNCT CLAY LOAM, 0 TO 2 PERCENT SLOPES	0.7697
121	BOGA-LOEMSTONE COMPLEX, 0 TO 1 PERCENT SLOPES	3.5338
1218u	COLUMBIA FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED	28.0000
125	GRIDLEY TAXADJUNCT-CALICO HAPLOXEROLLS COMPLEX, 0 TO 2 PERCENT SLOPES	1.2037
126	LIVEOAK SANDY LOAM, 0 TO 2 PERCENT SLOPES	31.4293
127	GRIDLEY TAXADJUNCT LOAM, 0 TO 2 PERCENT SLOPES	1.2037
130	EASTBIGGS LOAM, 0 TO 2 PERCENT SLOPES	2.6791
133	EASTBIGGS-GALT COMPLEX, 0 TO 3 PERCENT SLOPES	1.6461
136	DURIC XERARENTS-EASTBIGGS COMPLEX, 0 TO 1 PERCENT SLOPES, LEVELED	1.7212
1386u	LIVEOAK SANDY CLAY LOAM, 0 TO 2 PERCENT SLOPES	11.5526
1390u	LIVEOAK GALT TAXADJUNCT SANDY LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED	5.4952

Map symbol Map unit name

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Micrometers per second



Rating

0.5633
2.1740
2.5497
0.5633
2.6039
2.3371
6.2909
7.8606
57.3884
0.0100
57.3884
9.0000
0.7697
3.5338
28.0000

100 50 10 1.0 0.1 0.01
Permeability
(micrometers/second)

BUTTE COUNTY SOILS RECLASSIFIED BASED ON SOIL PERMEABILITIES

Micrometers per second

1 < 0.01

2 0.01 to 0.1

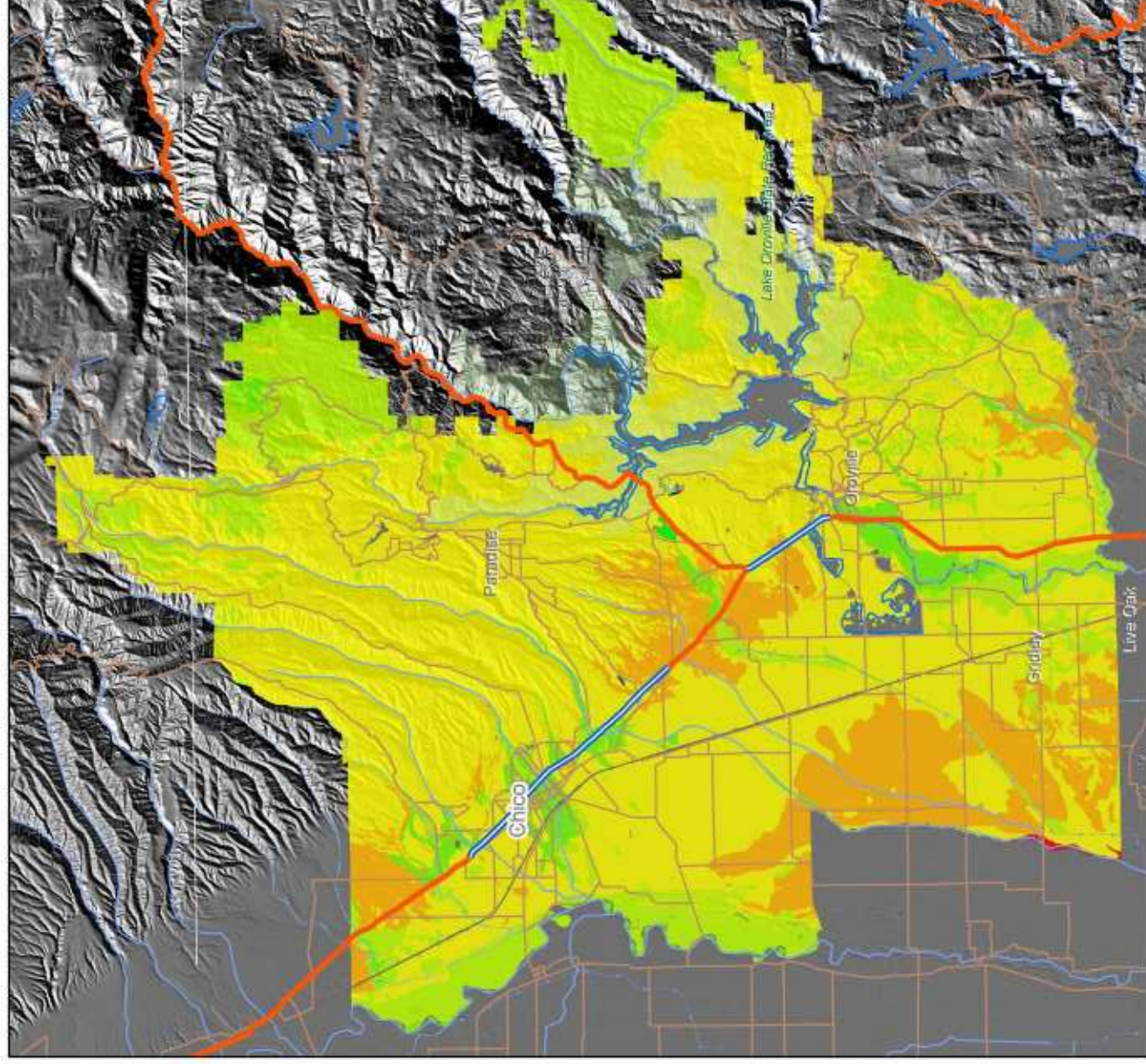
3 0.1 to 1.0

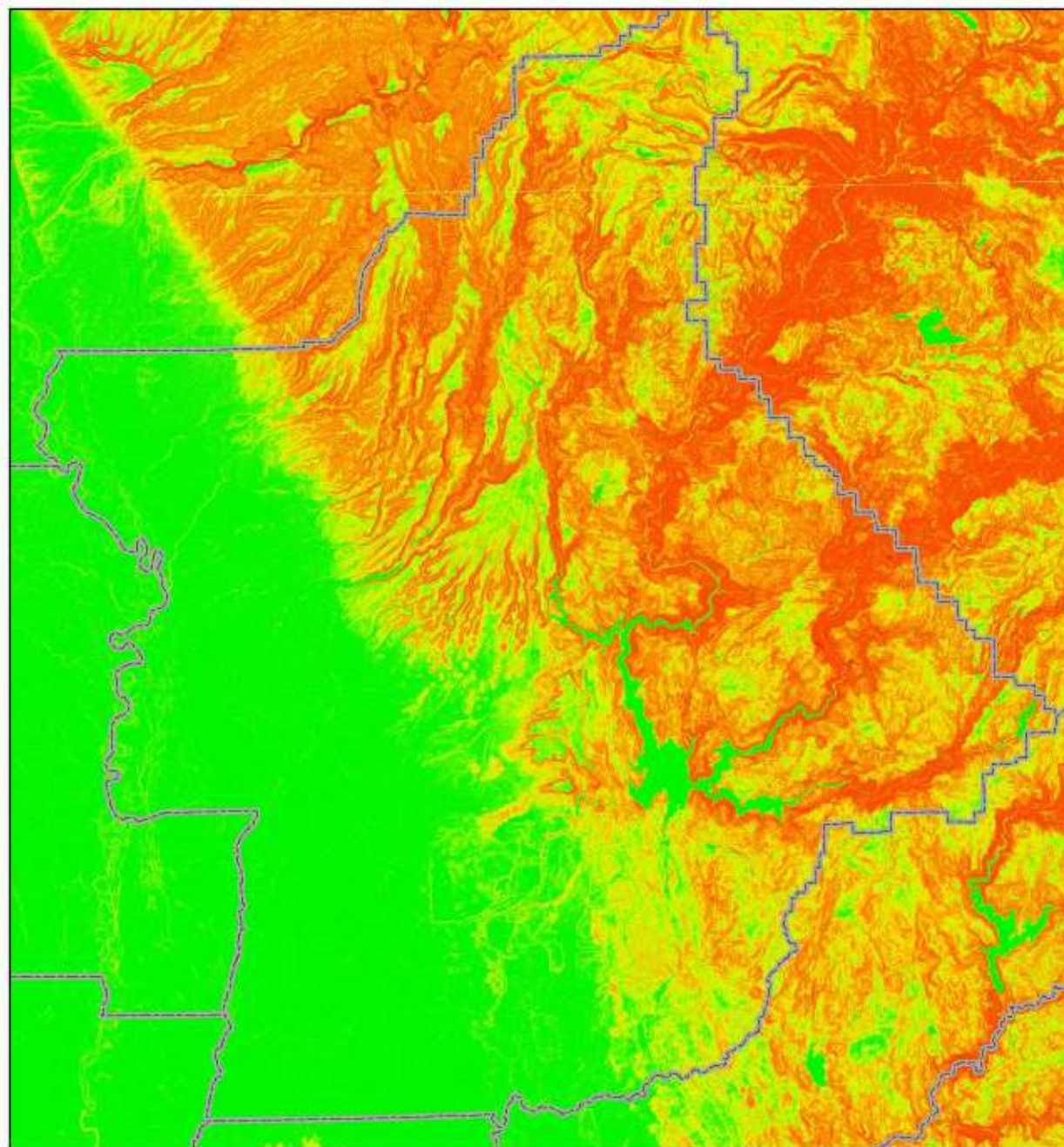
4 1.0 to 10

5 10 to 50

6 50 to 100

7 > 100





BUTTE COUNTY
REGION
DEM
RECLASSIFIED
BASED ON
SLOPE
"STEEPNESS"

Slope

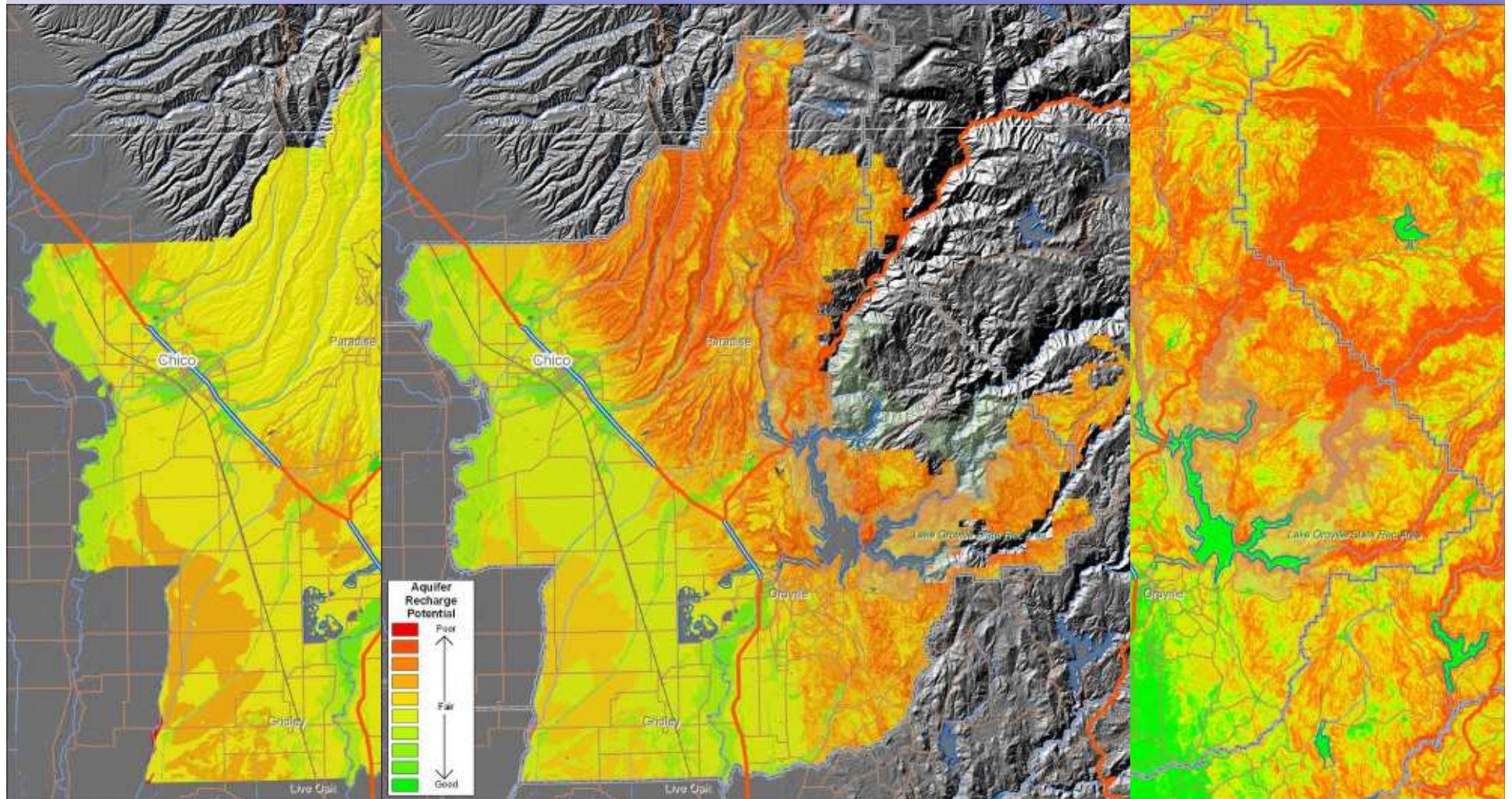
- 10 -- 0 to 1%
- 9 -- 1 to 2%
- 8 -- 2 to 3%
- 7 -- 3 to 5%
- 6 -- 5 to 7%
- 5 -- 7 to 10%
- 4 -- 10 to 15%
- 3 -- 15 to 25%
- 2 -- 25 to 50%
- 1 -- 50 to 100%

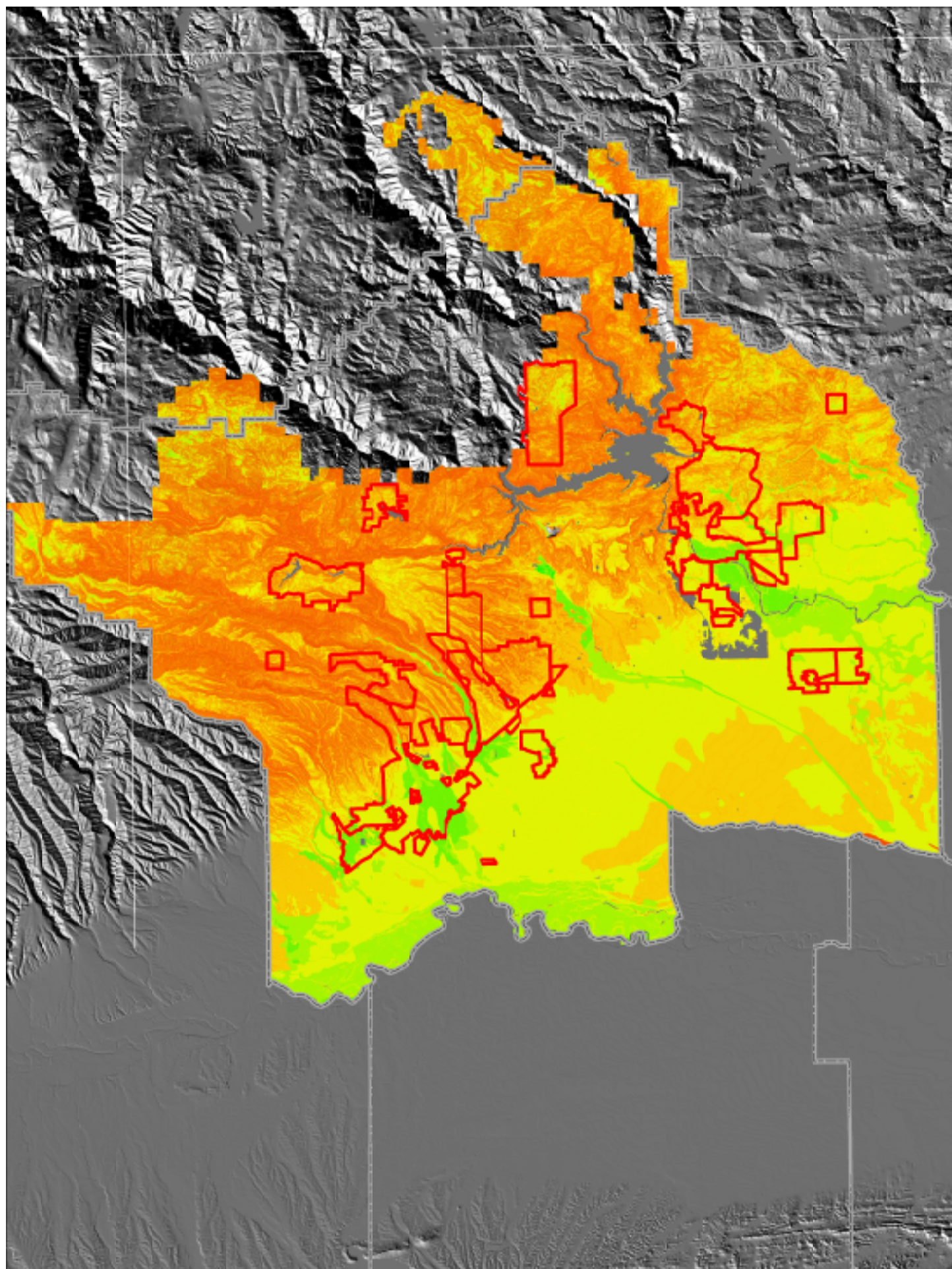
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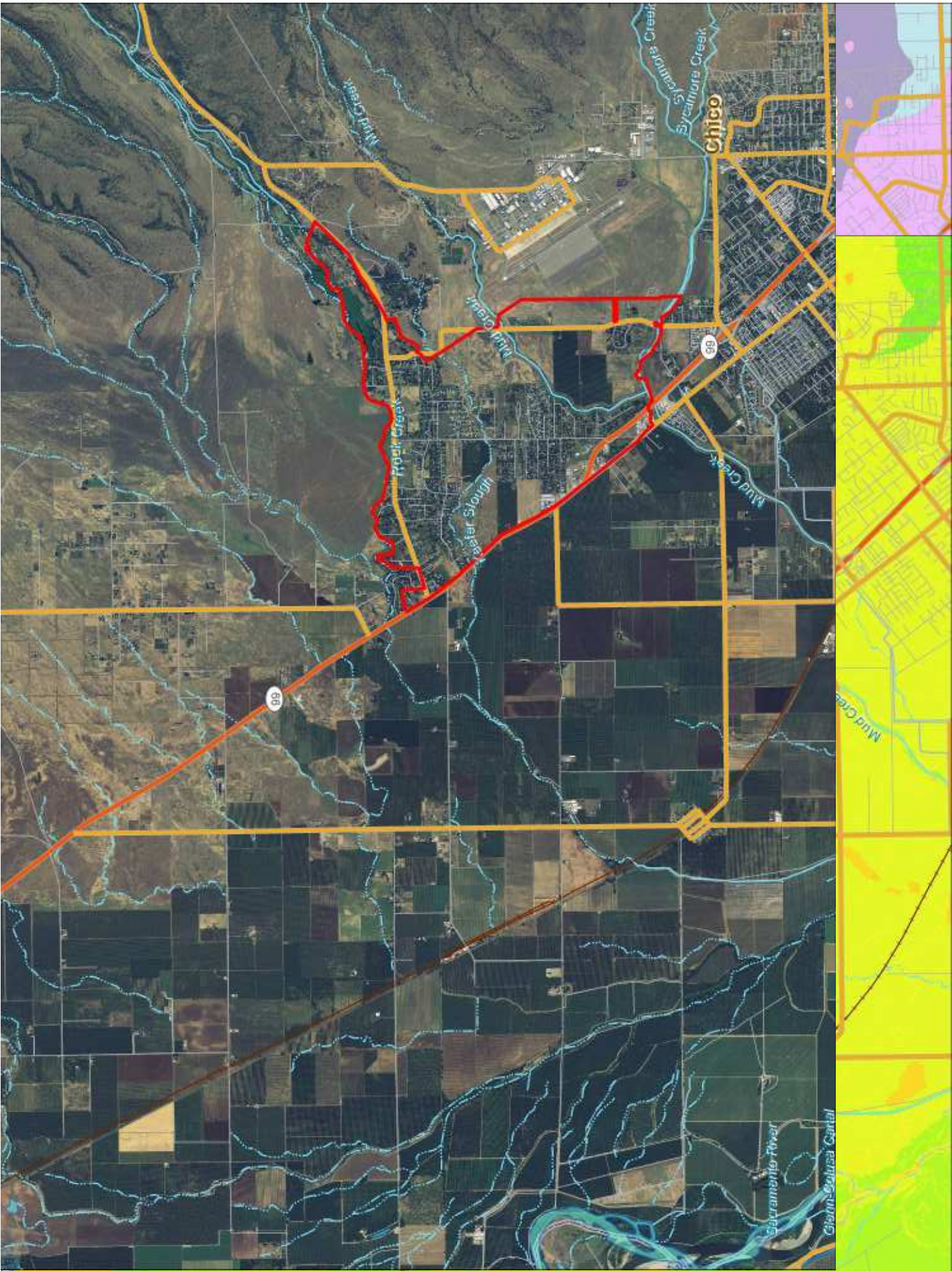
Slope (Degrees)

10 -- nearly level

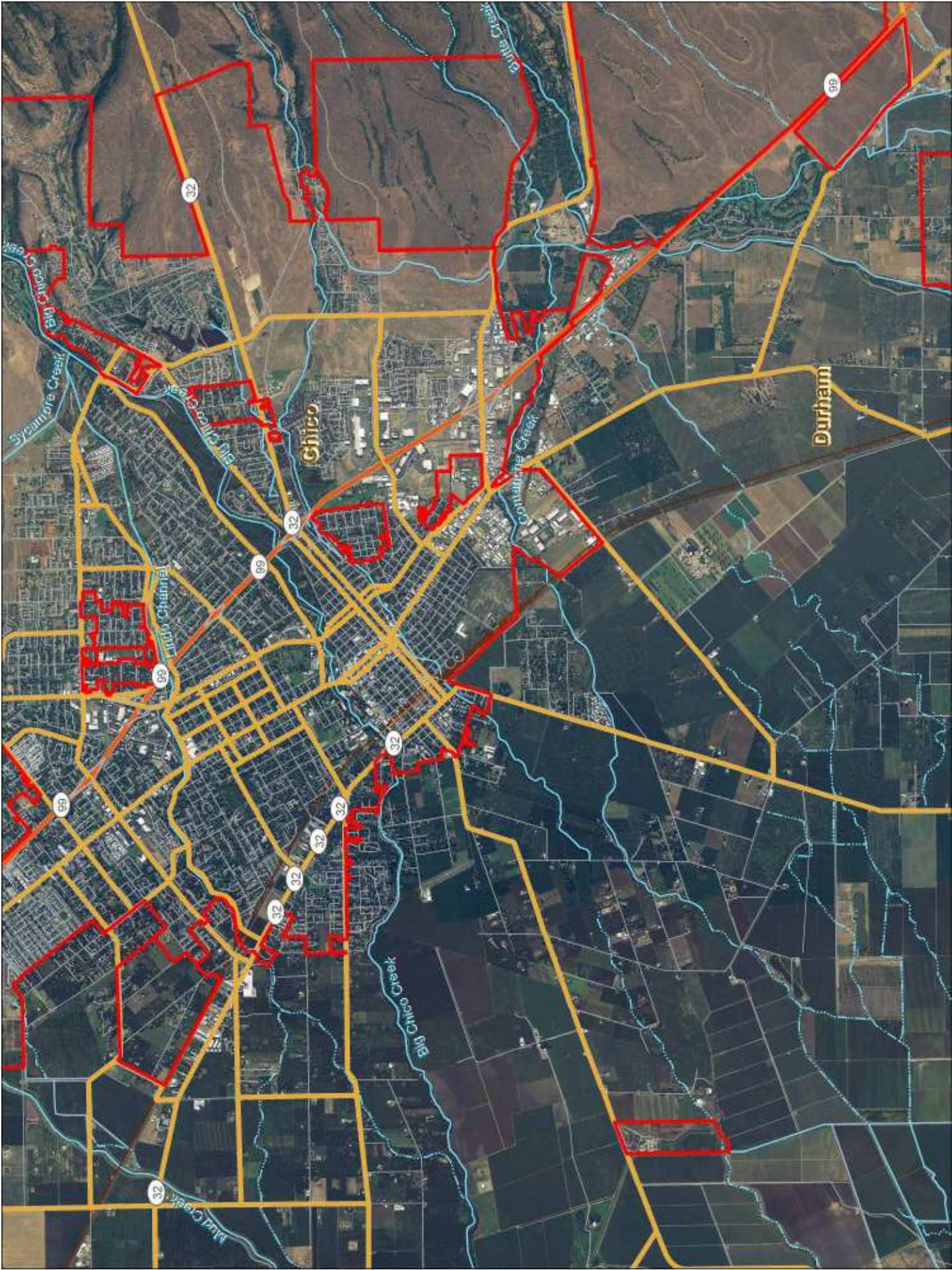
Using Raster Calculator,
multiply values from each raster layer
to combine a new layer
symbolizing potential aquifer recharge zones

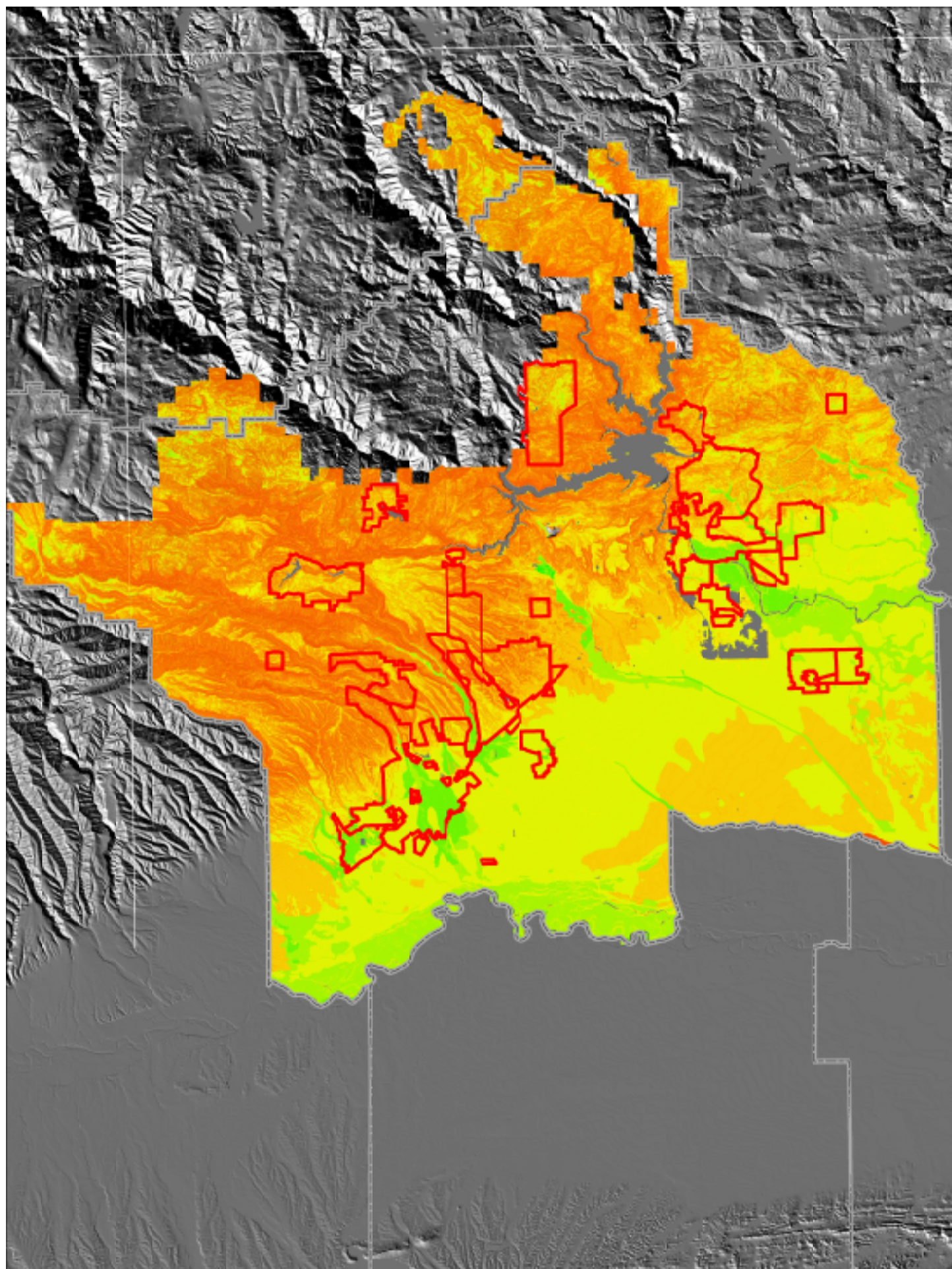


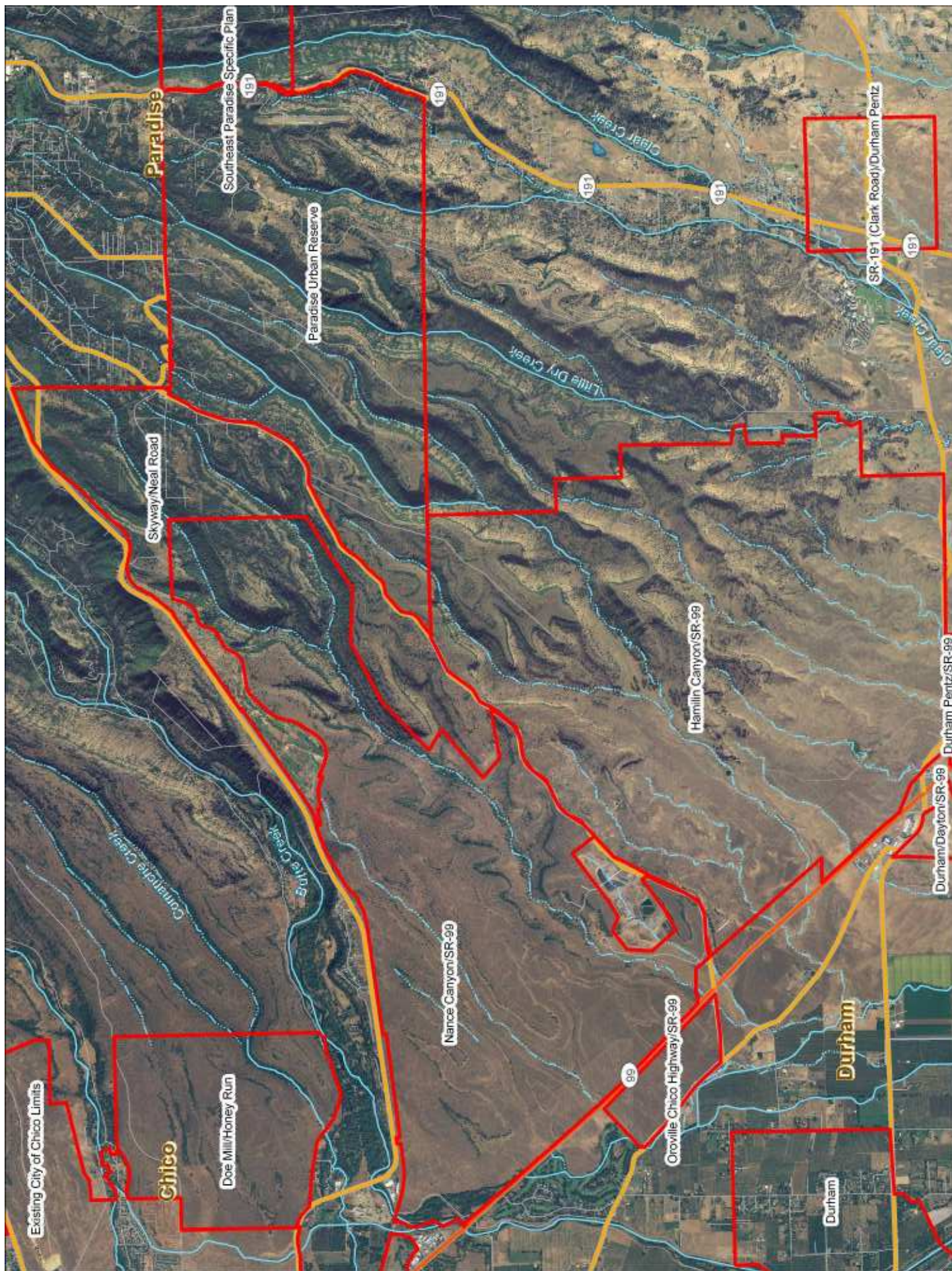


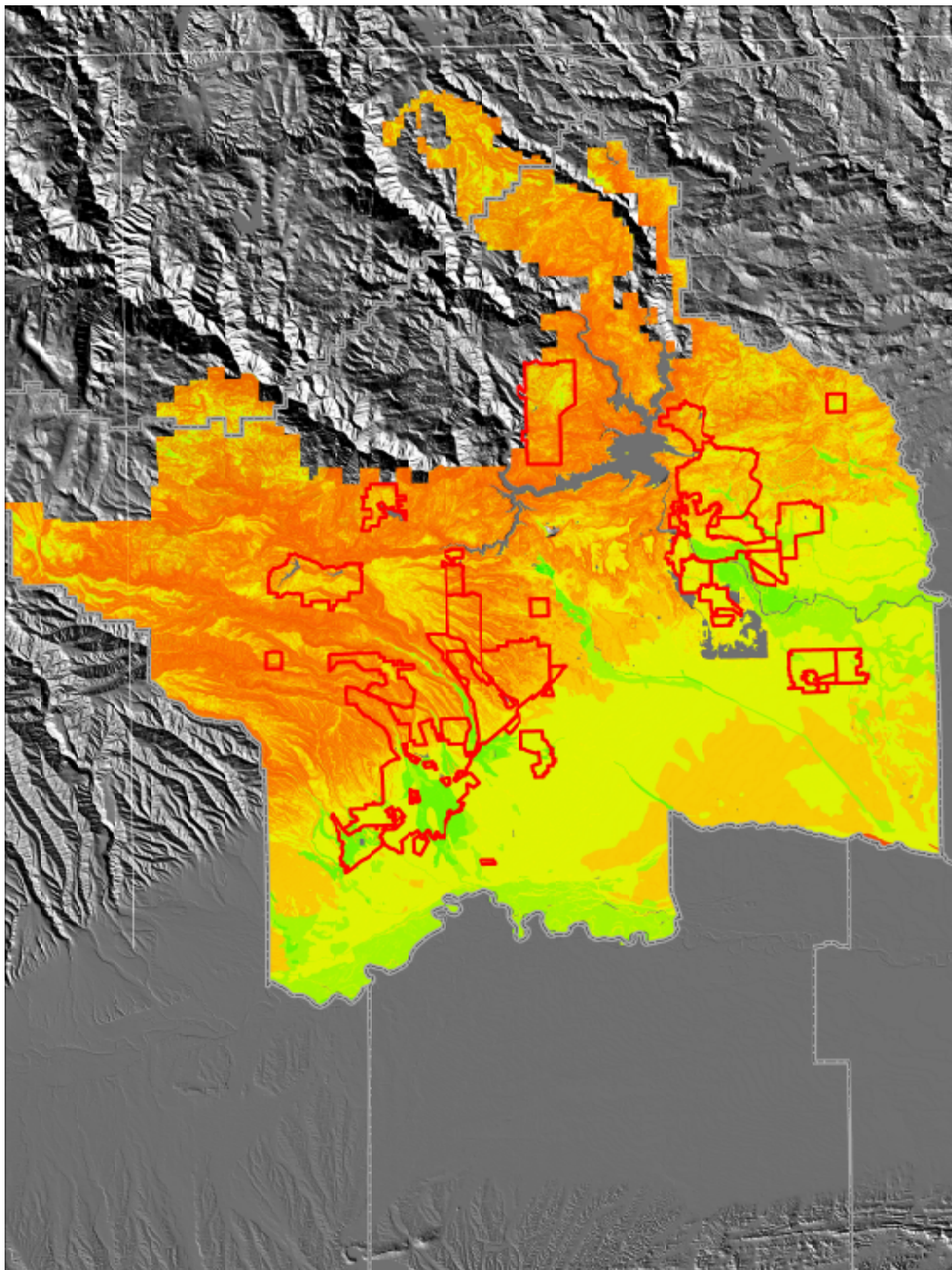


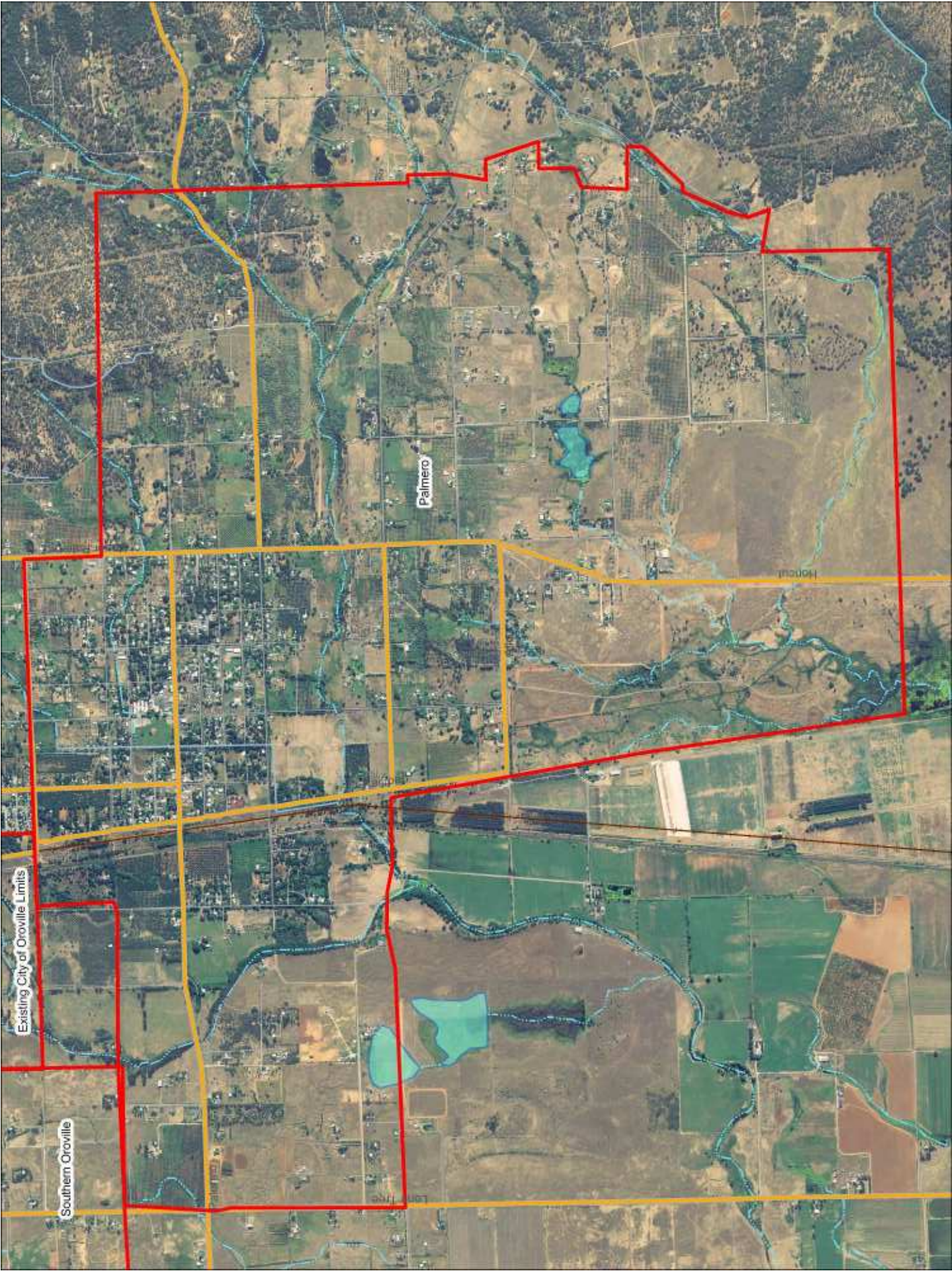




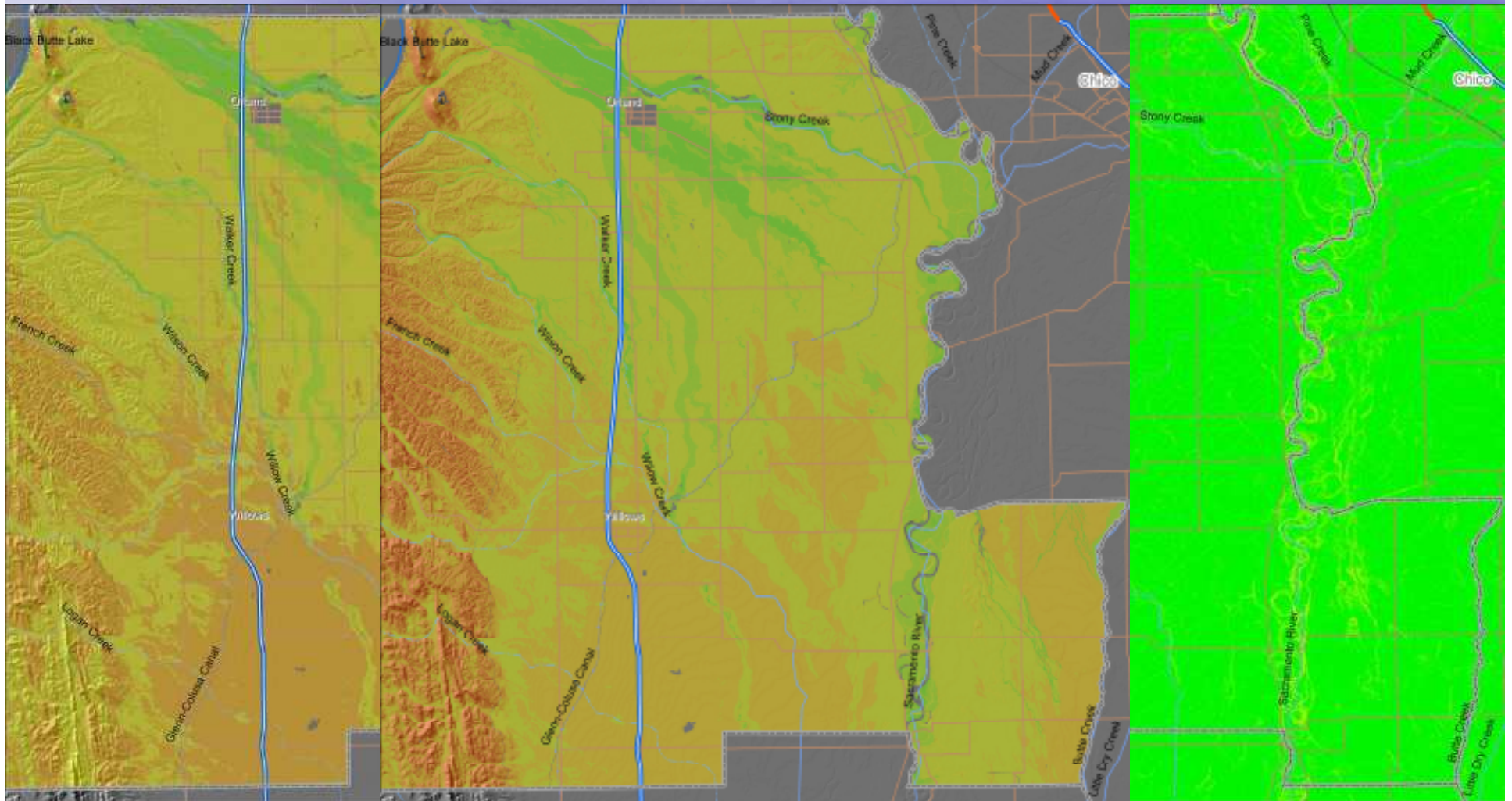


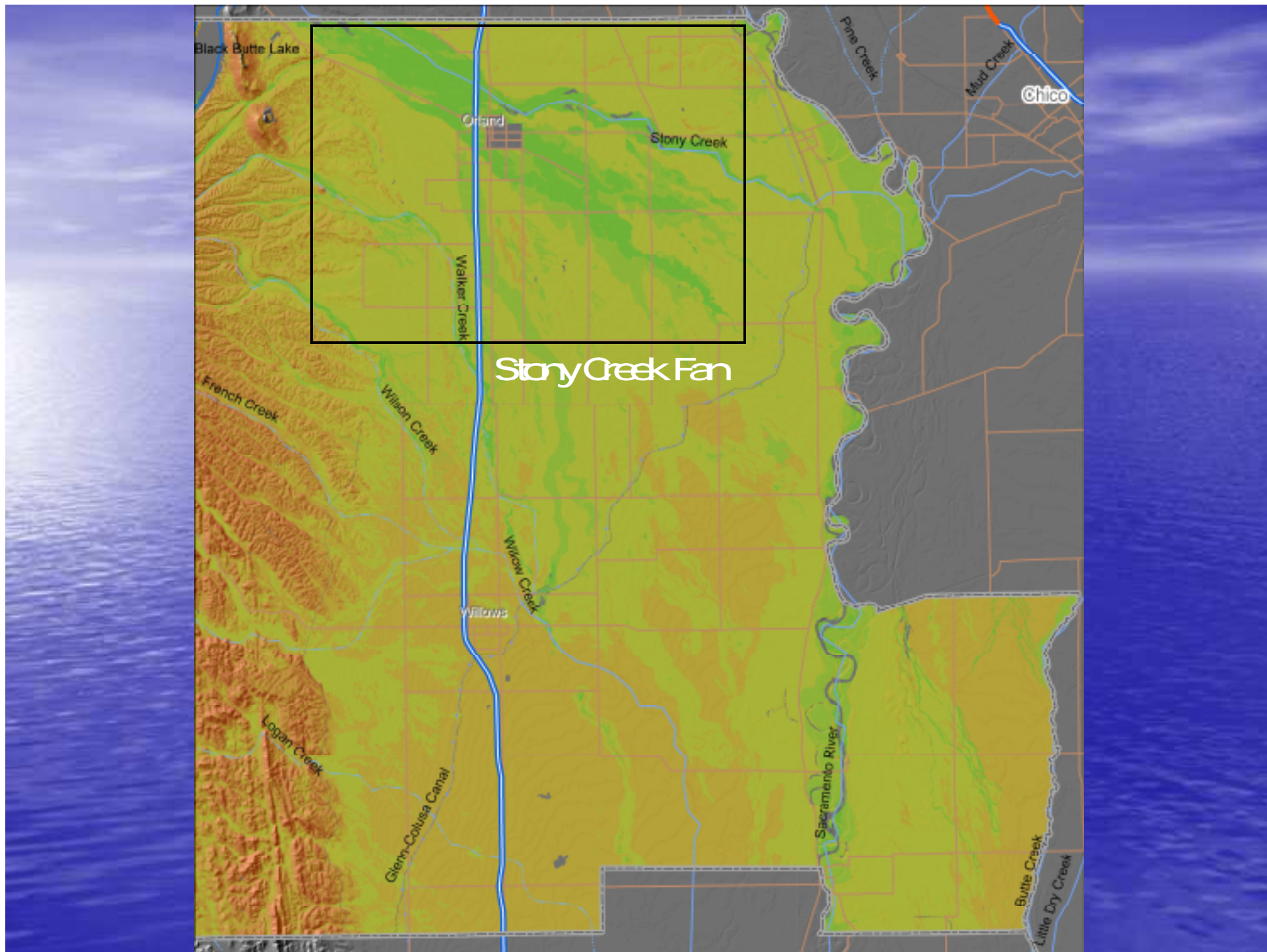


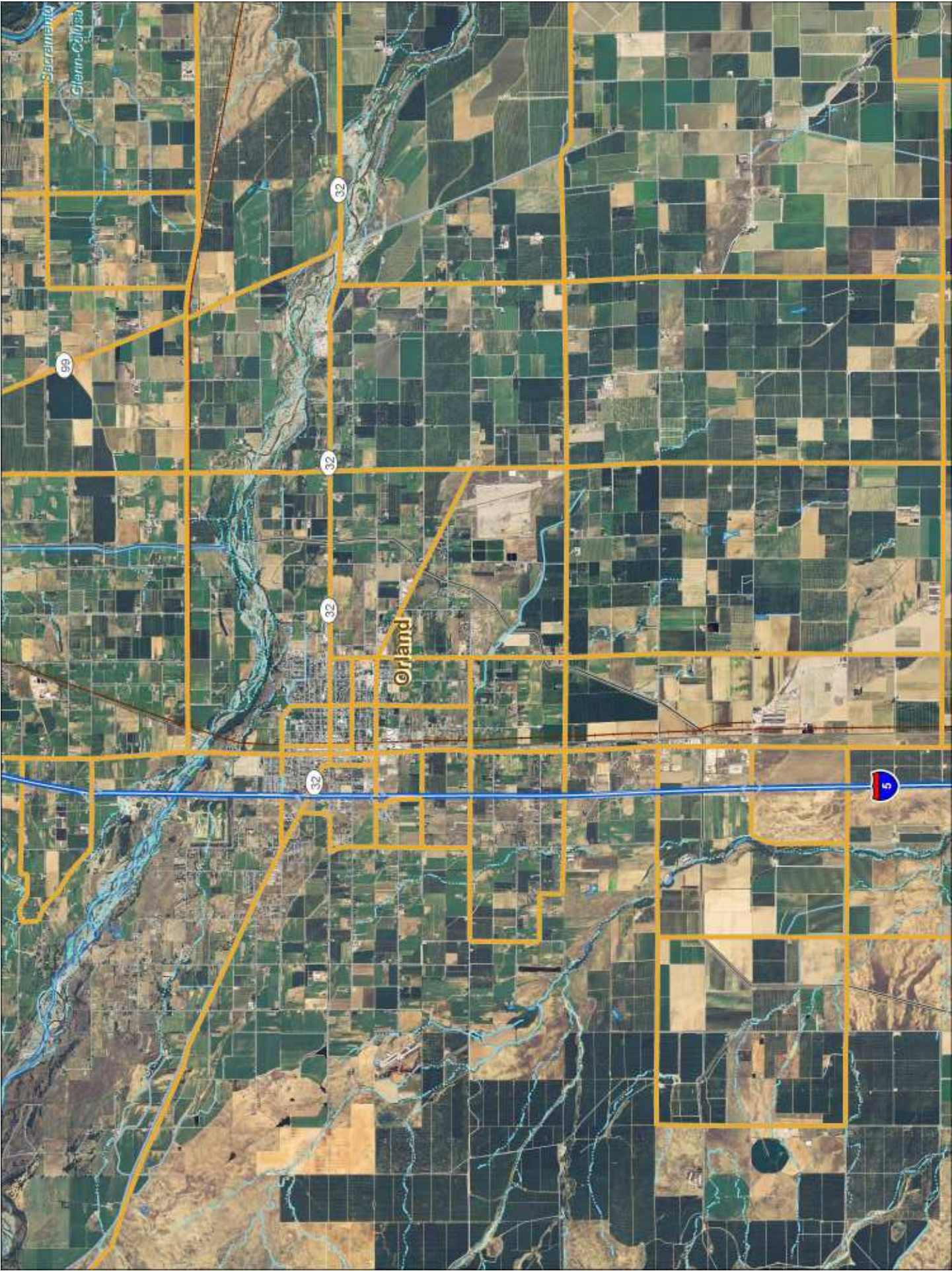




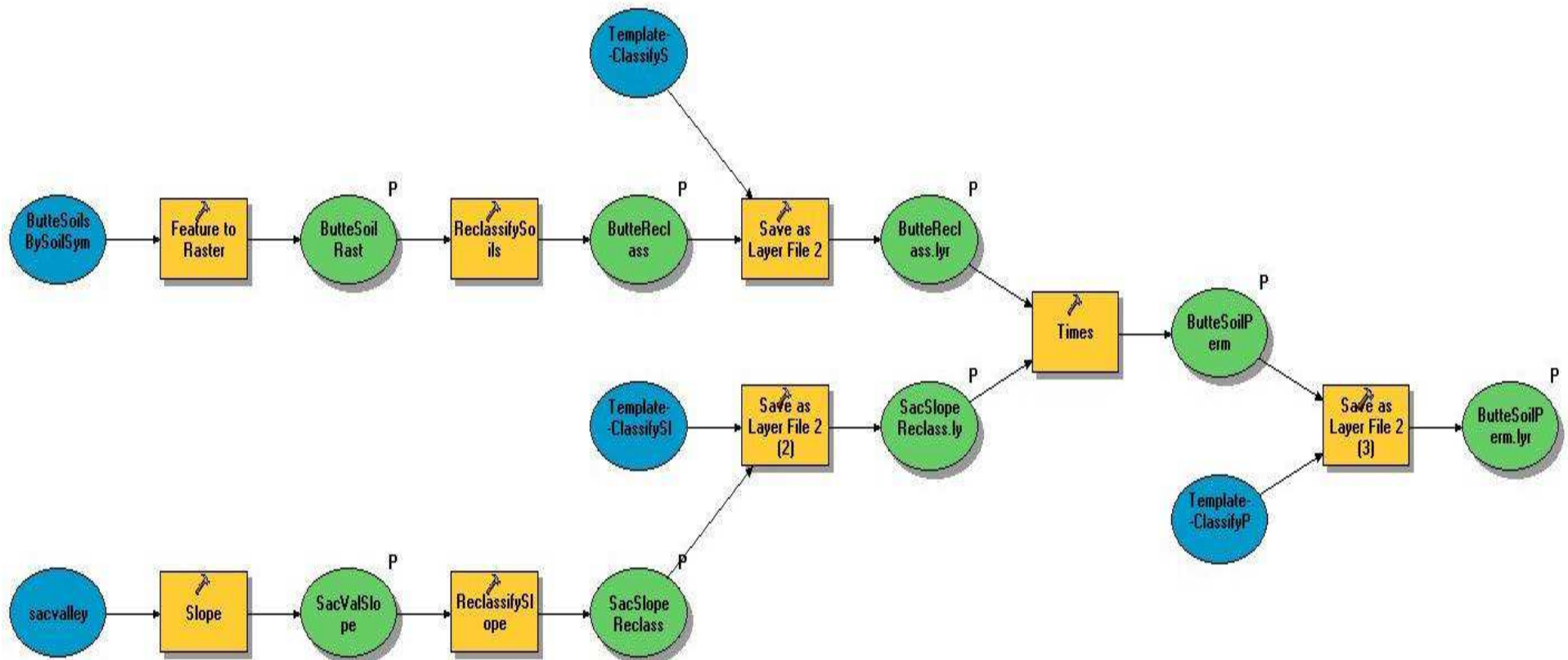
Using Raster Calculator,
multiply values from each raster layer
to combine a new layer
symbolizing potential seepage areas



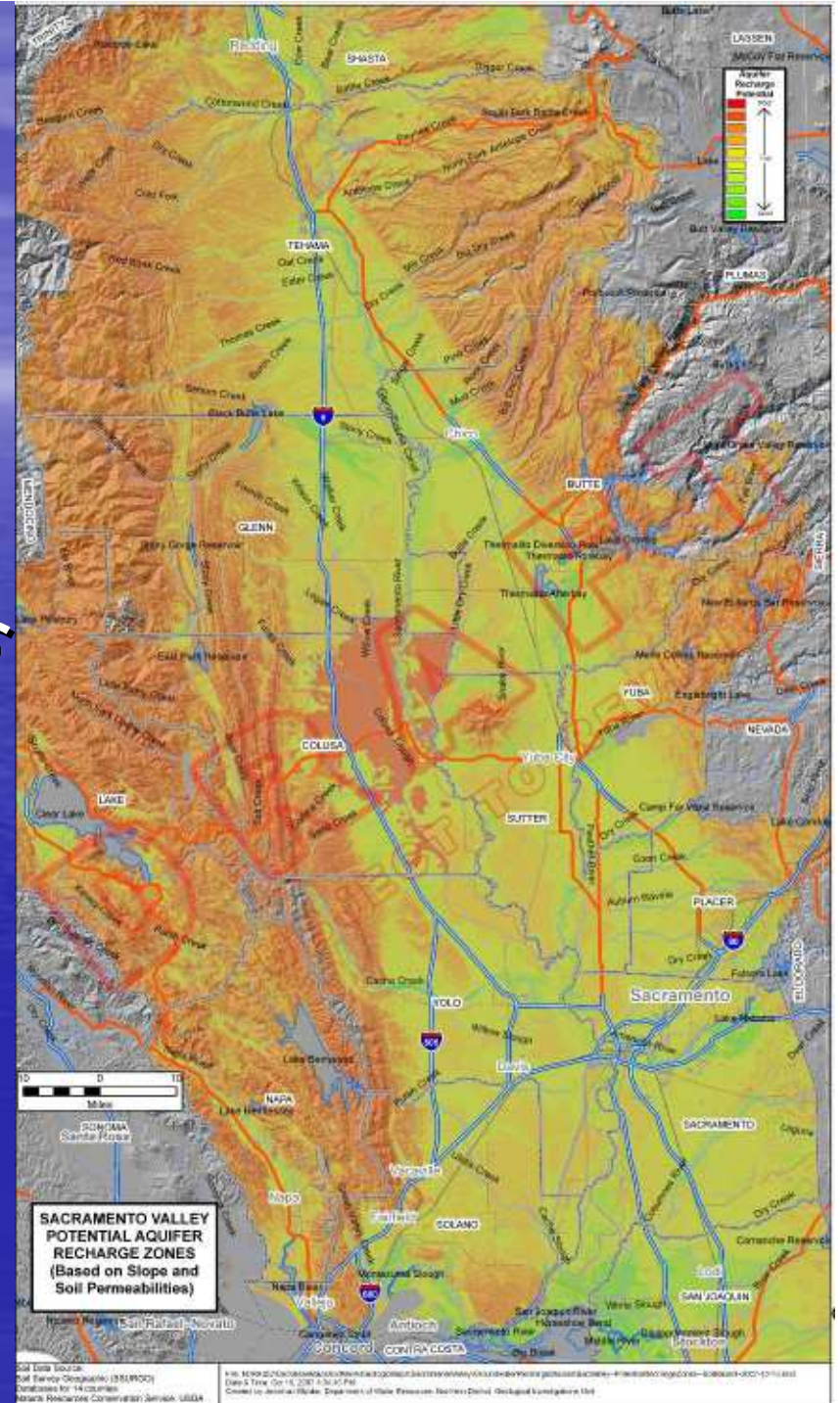


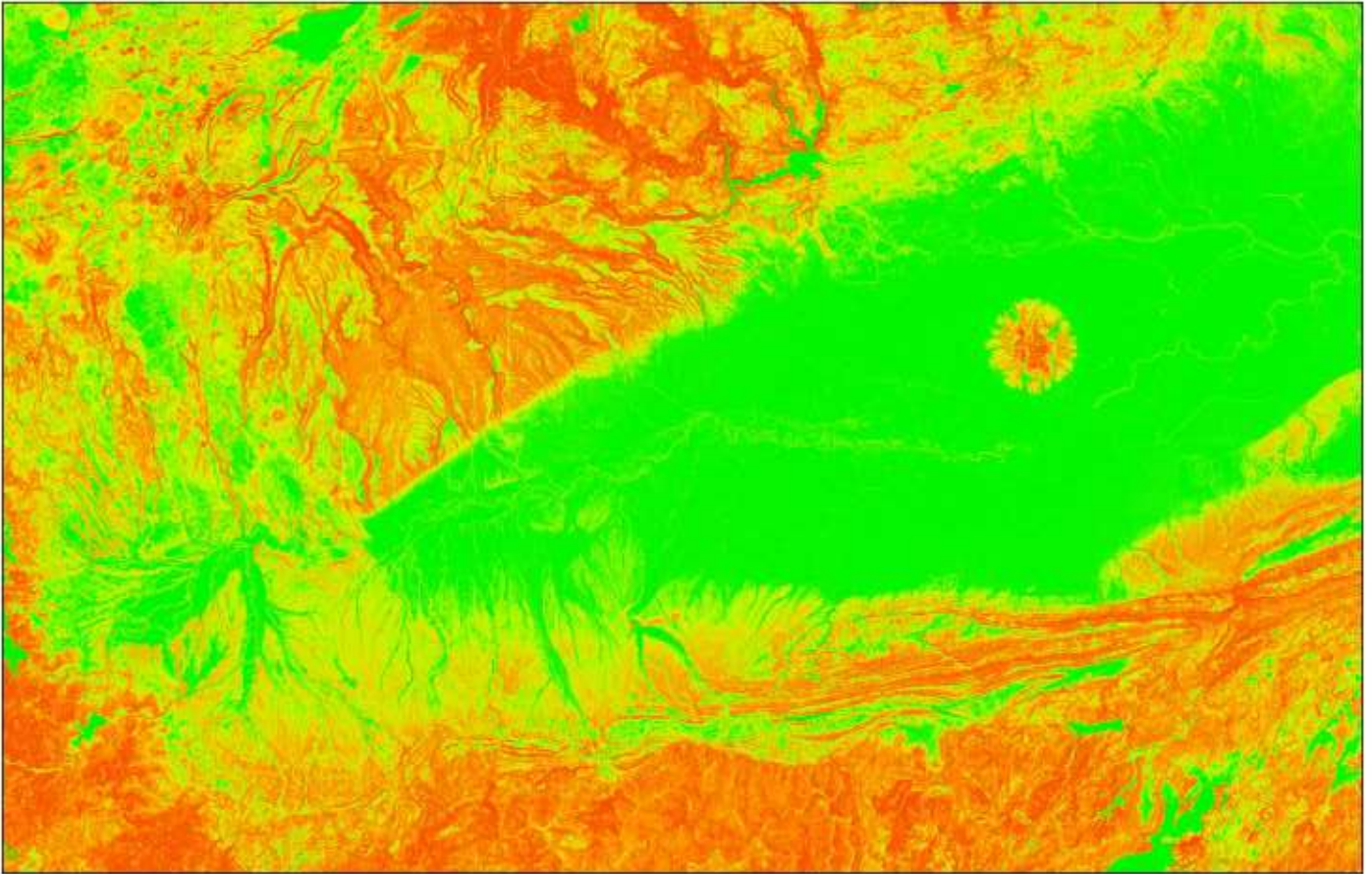
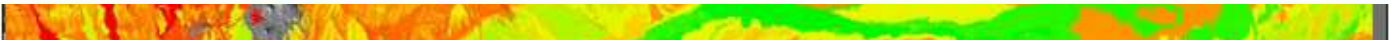
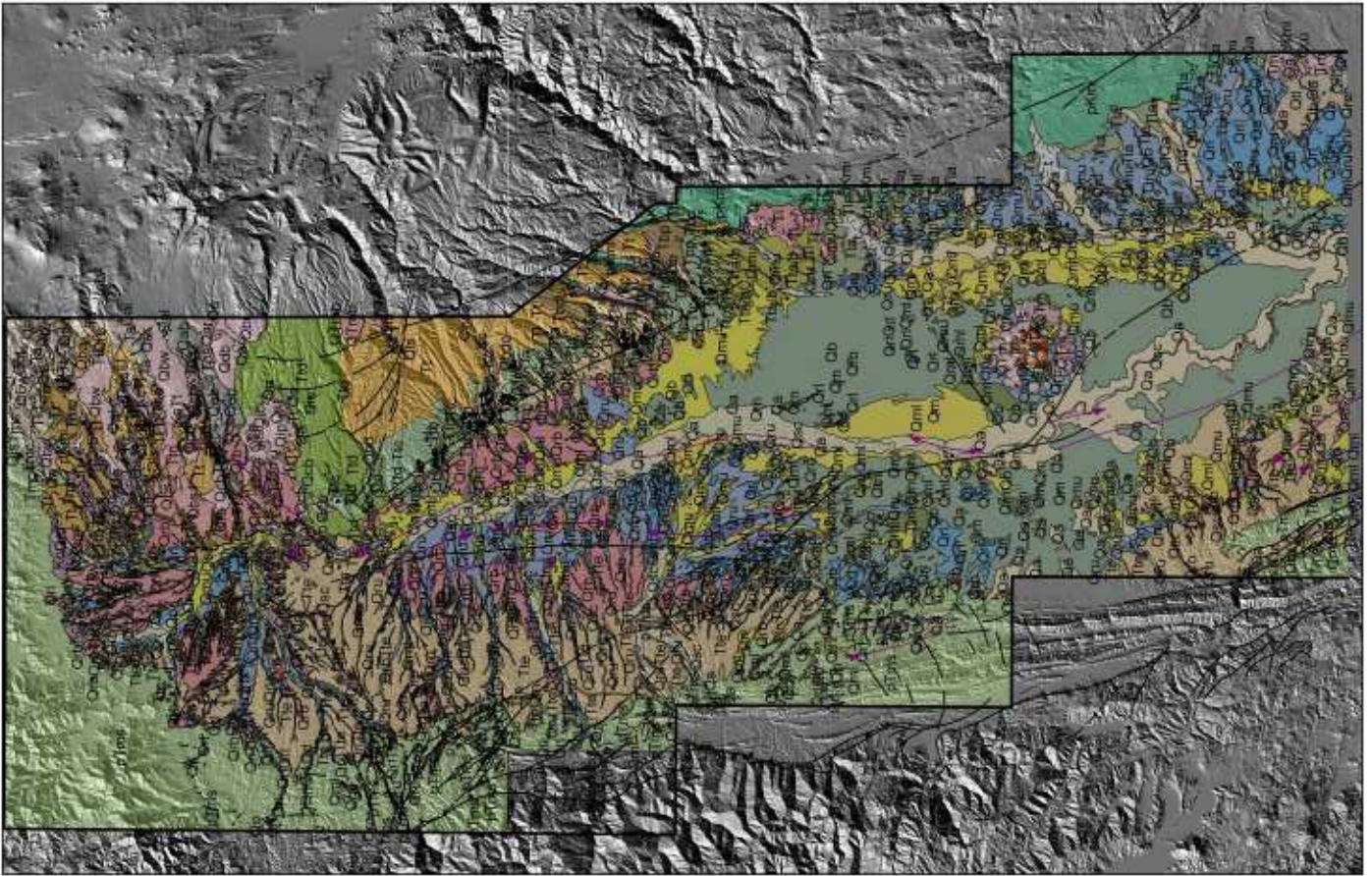


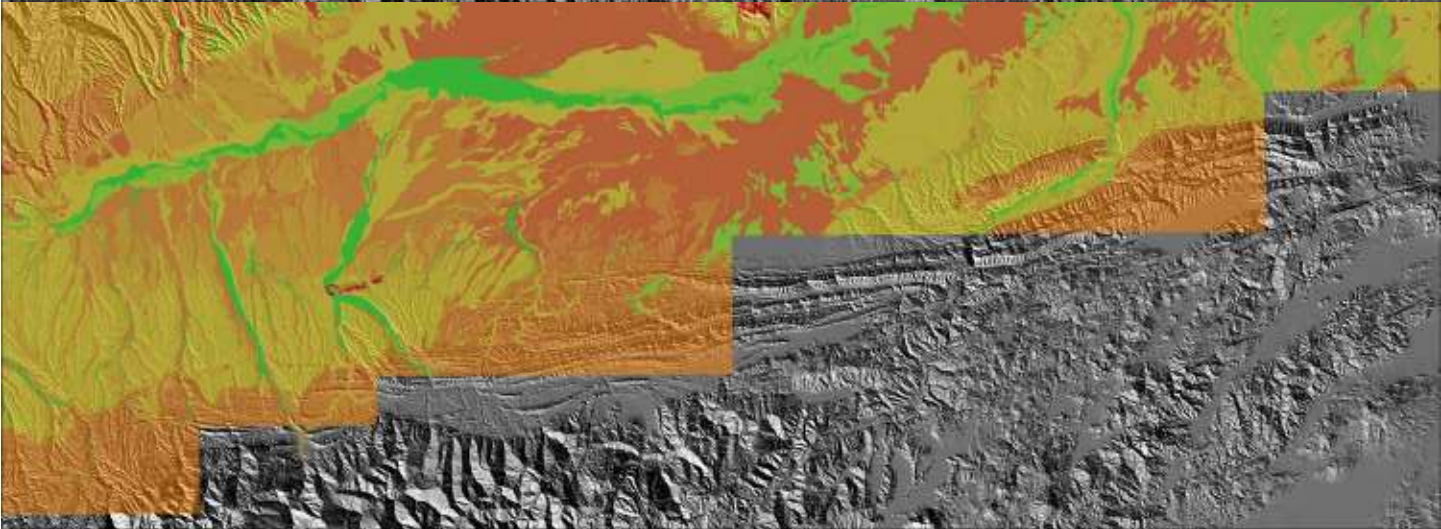
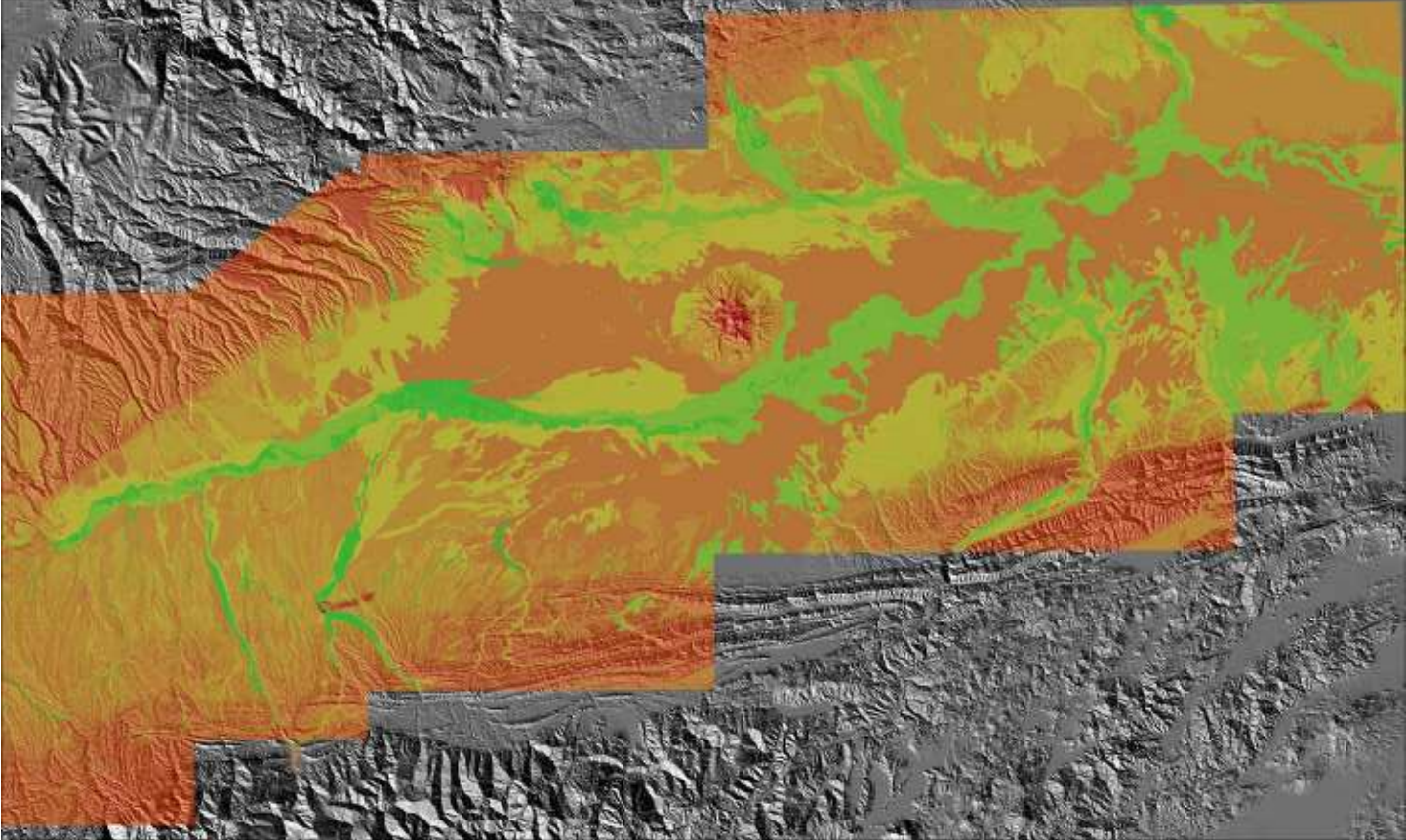
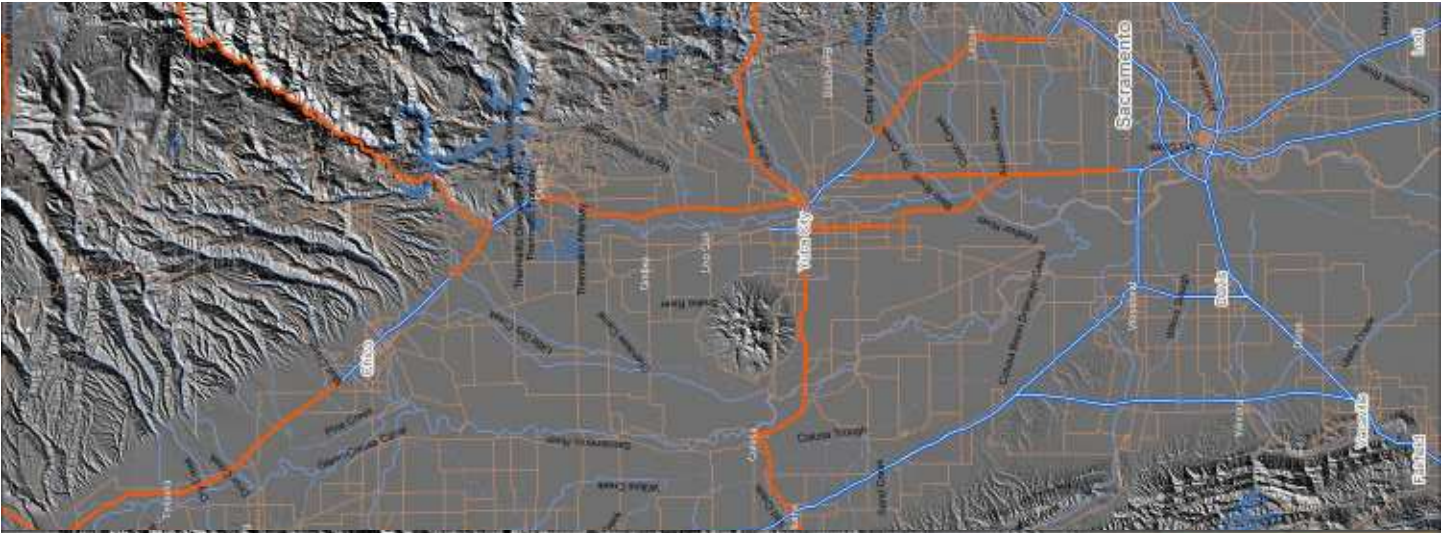
Use Geoprocessing model to automate procedure



Potential Aquifer Recharge Zones of Sacramento Valley (utilizing soil data sets from 14 counties)









- Spatial Analysis will not solve everything
- It is only another tool in the tool belt!





Thank you

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